

STUDIES ON THE INTRASPECIFIC VARIATIONS IN  
*BRACHYTHEMIS CONTAMINATA* (FABRICIUS)  
(ODONATA: LIBELLULIDAE)<sup>1</sup>

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(With thirteen text-figures)

INTRODUCTION

*Brachythemis contaminata* (Fabricius) is widely and most commonly available at temporary and permanent waterbodies. Variations within the species of Odonata have been briefly studied and reported by Asahina (1952-53); Singh and Baijal (1954); Baijal and Agarwal (1955); Singh and Prasad (1976, 1977); Prasad and Singh (1976); Prasad (1976a, 1976b); Raychaudhuri *et al.* (1969); Varshney and Guha (1972). A detailed study on the intraspecific variations in *Trithemis festiva* (Rambur) has been made by Prasad and Kumar (1981). Sahni (1970) while studying the Odonata fauna of Kumaon Hills has discussed in brief the intraspecific variations in *Brachythemis contaminata*. The present paper provides a detailed biometric analysis on the intraspecific variations alongwith a brief note on the field ecology, on the basis of material collected from different localities from India. All the measurements are in mm.

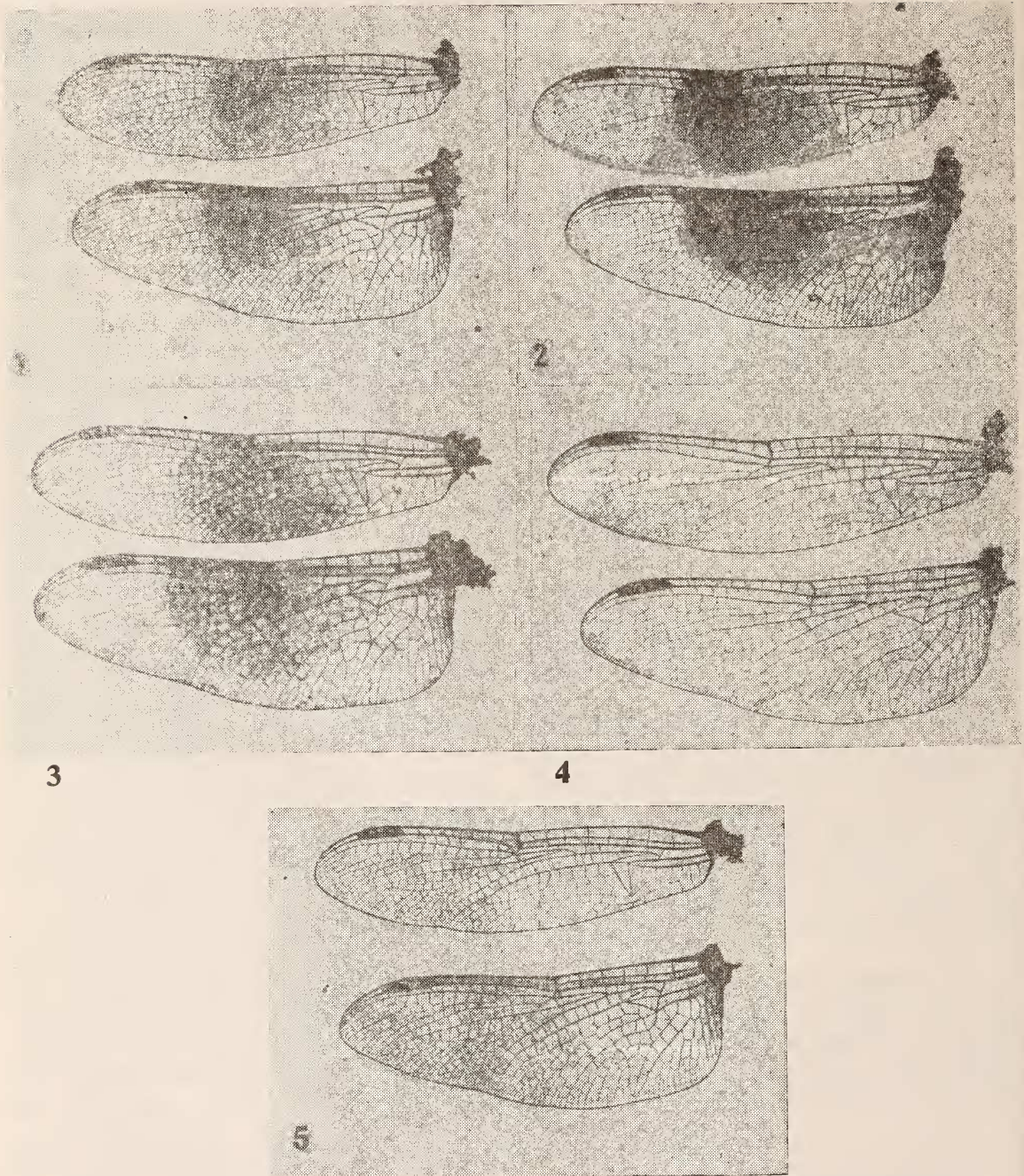
*B. contaminata* is distributed throughout the plains of India, Sri Lanka, Burma, China, Formosa, Philippines, Java and Sumatra (Fraser 1936); Lieftinck (1971); Kiauta (1975) and Kumar and Prasad (in press).

OBSERVATIONS

**Male:** Head small in size, Labium pale yellow to brownish yellow; Labrum dark yellow; face and vesicle pale greenish yellow; frons yellow, sometimes reddish yellow; eyes brown above; pale yellow laterally and beneath; occiput reddish brown. Prothorax brownish yellow; anterior and posterior border of middle lobe transverse by a dark brown stripe. Thorax yellowish brown dorsally marked with reddish brown humeral stripes; mid dorsal carina black. Legs pale yellow; femora dark brown on extensor surface; tibio tarsus yellowish brown; spines black. Wings short; rounded at apices; hyaline; reticulation closed; veins reddish in colour; a broad bright orange fascia extending from base to within 2 to 3 cells of pterostigma present in fore and hindwings. Variations in the marking of orange fascia in both fore and hindwings, only due to age of specimens (Figs. 1-3 and 6). Pterostigma rust red some times yellow in colour; membrane blackish brown; sector of arc fused at long origin. Arc situated in between 1st and 2nd antenodal nervures but more nearer to 1st antenodal nervures; discoidal cell in forewing narrow; costal side about half of the basal side or distal side; transversed only once; discoidal cell of hindwing with base at arc, entire; only one cubital nervure in both fore and hindwings. Cuii arising from the posterior angle of discoidal cell in hind wings;

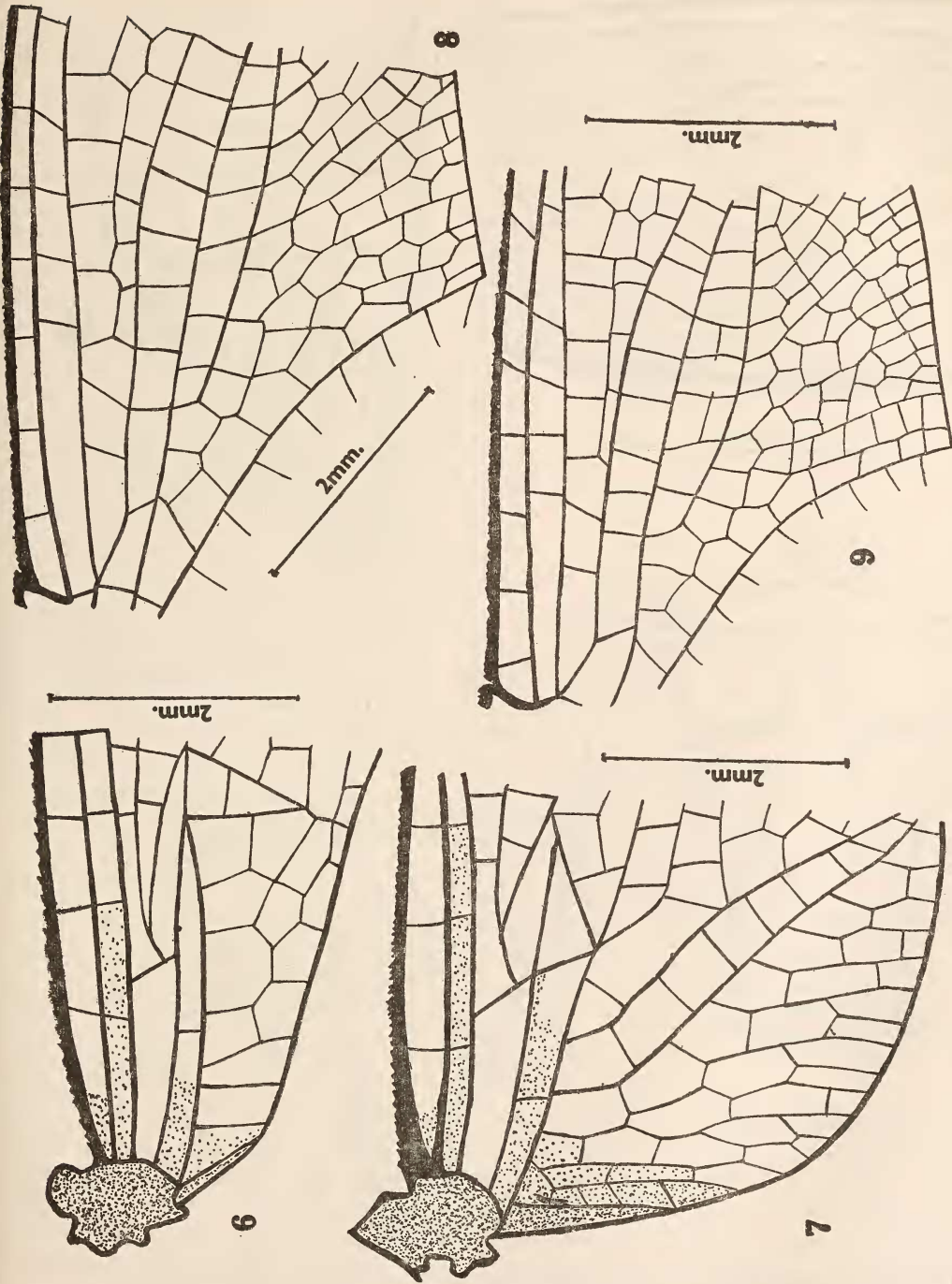
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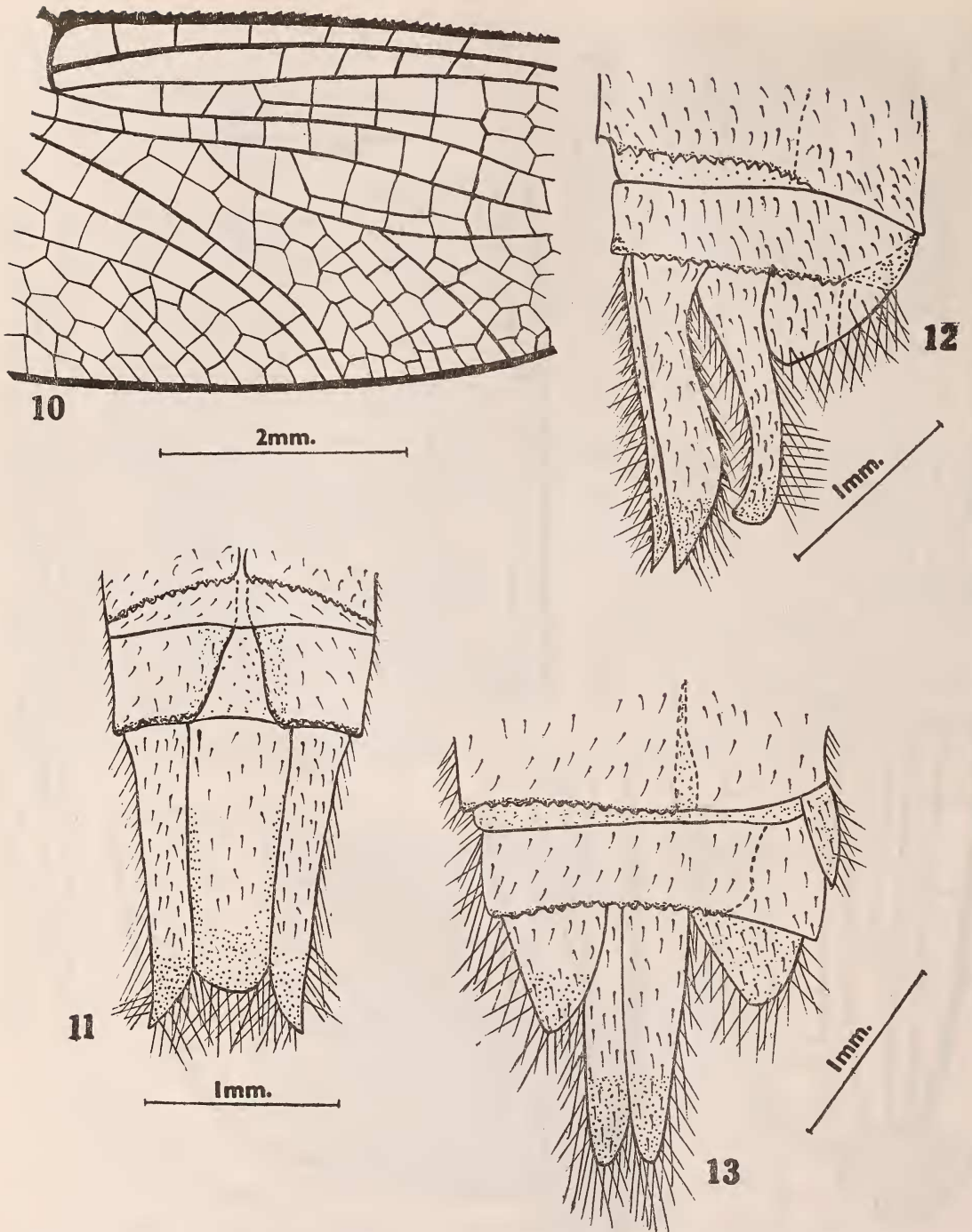


Figs. 1-3. Fore and hindwings of *Brachythemis contaminata* (Fabricius) (Male) showing variations in the marking of orange fascia.  
Figs. 4&5. *Brachythemis contaminata* (Fabricius) (Female) showing variations in the number of nodal index.

INTRASPECIFIC VARIATIONS IN BRACHYTHEMIS CONTAMINATA



Figs. 6&7. Yellow marking at the base of both fore and hindwings of *B. contaminata*:  
 6. basal sides of forewing of male; 7. basal sides of hindwing of female.  
 Figs. 8-10. Showing rows of one to two alls in between IRiii & RSPL in both fore  
 and hindwings of *B. contaminata*. (Fig. 10 on p. 344)



Figs. 11&12. Anal appendages of *B. contaminata* (male): 11. dorsal side; 12. lateral side.  
Fig. 13. Anal appendages of *B. contaminata* (female) dorsal side.

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discoïdal field beginning with 3 rows of cells; subtrigone in forewing three celled; one or two rows of cells in between IRiii & RSPL (Figure 8, 9 and 10), anal loop dilated at distal end and angulated. Nodal index as in Table 4. Abdomen reddish yellow marked with brown strips dorsally and sub-dorsally; segments 7th to 9th black on mid dorsum; teneral or sub-adult specimens, similar to the female. Anal appendages brownish yellow, apices black (figs. 11 & 12); a black spot also present at the base of inferior anal appendages.

**Genitalia:** Lamina anterior small, arched and hood shaped; Ligula small and triangular in out line, Hamuli posterior small with obtusely rounded base, Hook also small directed backwards and inwards with rounded apex; Genital lobe long, highly curved with obtuse apex; prophallus divided into stem body and glans; stem long and cylindrical; body broad and divided into triangular proximal lobe and distal rounded lobe; glans of prophallus rounded and membranous, Vesicula spermalis flask shaped with a shallow notch at the base.

**Female:** Similar to male but differs in the following: Head-Labium light pale yellow to brownish yellow; Labrum yellowish in colour, Face, frons and vesicle pale yellow; eyes pale brown above. Thorax greenish yellow; a narrow brown marking parallel to mid-dorsal carina; a dark brown stripe present near humeral suture; narrow blackish stripe present on centres of mesepimeron and metapimeron; mid dorsal carina and lateral sutures black.

**Wings:** (figs. 4 & 5) hyaline; Hindwings very palely tinted with yellow at base as shown in fig. 7. In few specimens base of hindwings not tinted with yellow; bright orange fascia absent; pterostigma bright yellow; nodal index as shown in table 4. Abdomen yellowish brown with a narrow black strip on mid dorsal carina extending from 2nd segment to 9th segment; a

TABLE 1  
SHOWING THE FREQUENCY OF SPECIMENS OF  
*Brachythemis contaminata* (FABRICIUS) FROM  
DIFFERENT LOCALITIES

Sl. No.	Locality	District	Male	Female
1.	Changsari	Kamrup (Assam)	5	3
2.	Shaikhoa (Doom dooma)	Soekerating (Assam)	2	-
3.	Kanker (Gobindapur)	Bastar (M.P.)	1	1
4.	Jodhpur	Jodhpur (Rajasthan)	3	3
5.	Nischinda (Bally)	Howrah (W. Bengal)	1	3
6.	Raghunathpur	Nadia (W. Bengal)	1	-
7.	Amarawati	24-Parganas (W. Bengal)	3	2
8.	Bakkhali	"	4	3
9.	Fraserganj	"	9	2
10.	Kakdwip	"	6	-
11.	Trilokchandpur	"	6	1
12.	Sonadanga	"	4	-

broad brownish spot present on segments 8th, 9th and 10th; a subdorsal interrupted dark brown stripe present on segment 2nd to 6th; all sutures and ventral border black. Anal appendages yellowish brown and apices black, long, conical, acuminate at the apex (fig. 13) Vulvar scales two, short, triangular plate like and overlapping ninth segment.

**Field ecology:**

Adults of both sexes flew in large number around the banks of temporary as well as permanent ponds and marshy streams from April to October. Oviposition occurs between June to October. Larvae are sluggish in habit and commonly found in shallow waters of the

TABLE 2

BODY MEASUREMENTS OF *Brachythemis contaminata* (FABRICIUS) (MALE)

Sl. No.	Abdomen with anal appendages	Fore-wing	Hind-wing	Length in between base to node		Length in between node to pterostigma		Maximum width of Hindwing	Pterostigma
				Forewing	Hindwing	Forewing	Hindwing		
1.	18.00	23.00	22.00	11.00	10.50	7.50	8.00	8.50	3.00
2.	18.50	22.00	21.50	11.00	10.50	7.00	7.50	8.00	3.00
3.	18.50	23.50	22.50	11.20	10.00	7.50	8.00	8.50	3.00
4.	18.50	24.00	23.50	11.50	10.30	7.50	8.00	8.00	3.00
5.	19.00	22.50	21.50	11.00	9.50	7.00	8.00	8.50	3.00
6.	19.00	23.00	22.50	11.00	10.00	7.50	8.00	8.00	3.00
7.	19.00	23.00	22.50	11.00	10.50	7.00	7.50	8.00	3.00
8.	19.00	23.50	22.50	11.50	9.40	7.00	7.50	8.40	3.00
9.	19.00	23.50	23.00	11.00	10.00	7.50	8.00	8.00	3.00
10.	19.00	23.50	23.00	11.00	10.00	7.50	8.00	8.40	3.00
11.	19.00	24.00	22.50	11.80	9.80	7.00	7.00	8.40	3.00
12.	19.00	24.00	23.00	11.50	10.00	8.00	8.00	8.50	3.00
13.	19.00	24.00	23.00	11.00	9.50	7.50	7.50	8.50	3.00
14.	19.50	23.50	23.00	11.00	10.00	7.50	7.50	8.00	3.00
15.	19.50	24.00	23.00	11.00	10.00	7.00	8.00	8.20	3.00
16.	19.50	24.00	22.50	11.50	9.50	7.00	7.50	9.00	3.00
17.	20.00	23.00	22.40	11.00	10.50	7.50	8.00	8.00	3.00
18.	20.50	24.00	23.00	11.50	9.80	7.50	7.50	8.50	3.00
19.	21.00	25.50	24.50	12.00	10.50	7.00	7.50	8.50	3.00
20.	21.00	25.00	24.00	12.00	11.00	8.50	9.00	9.00	3.00
21.	21.50	25.00	24.50	12.50	11.50	8.00	9.00	9.50	3.00

TABLE 3

BODY MEASUREMENTS OF *Brachythemis contaminata* (FABRICIUS) (FEMALE)

Sl. No.	Abdomen with anal appendages	Fore-wing	Hind-wing	Length in between base to node		Length in between node to Pterostigma		Maximum width of Hindwing	Pterostigma
				Forewing	Hindwing	Forewing	Hindwing		
1.	19.00	24.00	24.00	12.50	10.50	7.50	7.80	8.50	3.00
2.	19.00	25.00	24.00	12.80	10.50	7.50	8.00	8.50	3.00
3.	19.00	25.00	24.50	13.00	10.50	8.50	8.80	8.00	3.00
4.	19.00	25.00	23.00	12.00	10.00	8.00	8.00	9.00	3.00
5.	19.50	25.50	24.00	13.00	11.00	7.80	8.50	8.50	3.00
6.	19.50	26.00	25.00	13.80	11.00	8.00	8.50	9.00	3.00
7.	20.00	23.00	22.50	12.00	10.00	7.50	8.00	8.00	3.00
8.	20.00	25.00	24.00	12.50	11.00	8.50	8.50	9.00	3.00
9.	20.50	25.50	25.00	12.50	11.00	8.00	8.50	8.50	3.00
10.	21.00	25.00	24.00	12.00	10.50	8.50	9.00	9.00	3.00

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TABLE 4

SHOWING VARIATIONS IN NODAL INDEX WITHIN THE MALE AND FEMALE SPECIMENS OF *Brachythemis contaminata* (FABRICIUS)

Male		Female	
5-7½   7½-6			
-+ -			
6-5   5-7			
5-7½   7½-7,	6-7½   7½-8,	6-7½   8½-7,	6-7½   7½-6
-+ -	-+ -	-+ -	-+ -
7-5   5-8	7-5   6-7	6-5   5-8	7-5   5-7
6-8½   7½-6,	6-8½   8½-8,	7-7½   7½-7,	7-7½   7½-6,
-+ -	-+ -	-+ -	-+ -
6-5   6-5	7-5   5-8	6-5   5-6	7-5   5-7
6-8½   8½-7,	7-7½   7½-8	7-8½   8½-6	
-+ -	-+ -	-+ -	
7-5   6-7	6-5   5-6	7-6   5-8	
7-7½   7½-7,	7-7½   7½-7		
-+ -	-+ -		
7-5   5-8	7-5   5-7		
7-7½   7½-7,	8-7½   7½-7		
-+ -	-+ -		
8-5   5-8	7-5   5-7		

TABLE 5

SHOWING VARIATIONS IN BODY MARKING IN MALE AND FEMALE OF *Brachythemis contaminata* (FABRICIUS) AND COMPARED WITH THE PUBLISHED DESCRIPTION OF THE SPECIES

Sl. No.	Different parts of body	Male	Female	Published description of the species
1.	Labium	Pale yellow to brownish yellow	Same as male	Pale ochreous
2.	Labrum	Dark yellow	Light pale yellow	Reddish ochreous
3.	Nodal index	5-7½   7½-6 to -+ - 6-5   5-7 7-7½   7-7½ and -+ - 8-5   5-8 8-7½   7½-7 -+ - 7-5   5-7 -	6-7½   8½-7 to -+ - 6-5   5-8 7-8½   8½-6 -+ - 7-6   5-8	6-7½   7½-6 -+ - 5-6   6-5
4.	Base of the Hindwings in female	-	Base of hindwing may be tinted with yellow or hyaline	Base of hindwings in female palely tinted with yellow
5.	Anal appendages	Brownish yellow apices black	Yellowish brown apices black	Ferruginous in male, yellow in female with black apices.

ponds, amidst standing reeds. For emergence they climb on the reeds (Kumar 1973). A large number of exuviae can easily be collected during this period hanging on reeds about 4 inches to a foot above the water.

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